



## **PCBs IN SUBMERSIBLE WELL PUMPS**

### **Fact Sheet**

#### **How can PCB contamination occur through wells?**

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Electric pumps and motors, including submersible well pumps that are found in some drinking wells, need capacitors to operate. Submersible well pumps are mostly used for residential wells and rural restaurants, taverns, motels, grocery stores, child care facilities and health care facilities. Some submersible well pumps manufactured before 1978 likely contain capacitors with up to five ounces of PCBs. PCBs can leak out of capacitors through normal wear-and-tear and corrosion, or as the result of electrical failures or lightning strikes.

If PCB-contaminated coolant oil leaks out into the well, the pump may continue to operate, and tainted oil and water can enter into associated plumbing systems. Human exposure can occur by drinking or bathing with contaminated water, and by inhaling contaminated water vapor from showerheads, steam heat radiators, humidifiers, or dish and clothes washers.

#### **What are PCBs?**

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Polychlorinated biphenyls, or “PCBs”, are a class of chlorinated, chemical compounds that were used primarily in oils because of their non-flammable properties and, chemical stability. Throughout the 20th century, oils containing PCBs were used in many different types of equipment, including hydraulic and heat transfer systems, vacuum pumps, and compressors. Their primary use, however, was as a dielectric fluid in transformers and capacitors. Prior to 1978, almost all capacitors were filled with PCBs. Although the manufacture of PCBs has been banned in the US. Since 1977 and prohibited from most non-electrical use in Canada since 1977, PCBs may still be used in certain transformers, capacitors, and other electrical equipment.

#### **What are the risks of PCB contamination?**

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PCBs are classified as probable human carcinogens. Tests have shown that PCB exposure can cause cancers and tumors, as well as liver, eye, and gastric tract disorders in laboratory animals. Humans and animals are also vulnerable to PCB effects on the endocrine system during gestation and when very young. This can result in birth defects and reproductive failures. PCBs persist in the environment after they are released, accumulate in the fatty tissue of organisms, and are ‘magnified’ when consumed by animals higher in the food chain. Long-term health effects are often not immediately apparent.

#### **What are the Permissible Levels of PCBs?**

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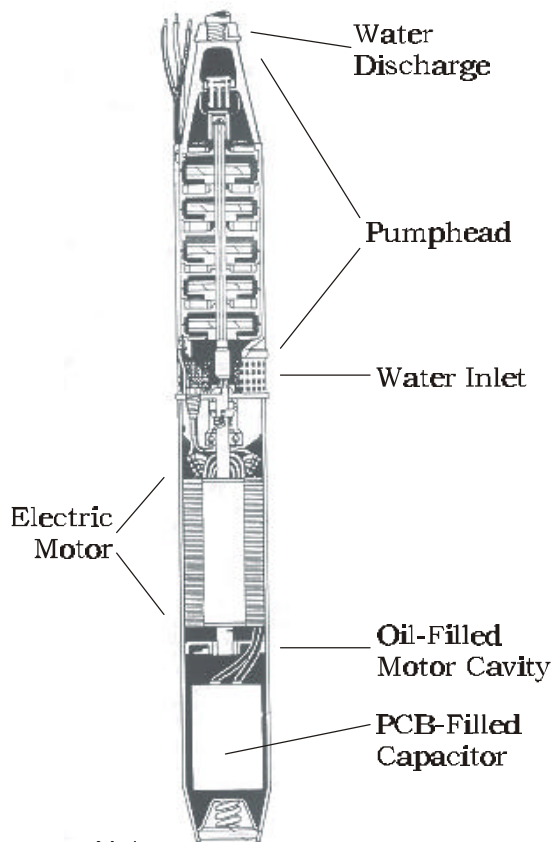
The Environmental Protection Agency (EPA) has set a maximum contaminant level for PCBs of 0.0005 milligrams per liter of drinking water (0.5 ppb), and releases of one or more pound of PCBs into the environment are required to be reported to the EPA. The Food and Drug Administration (FDA) requires that foods not contain more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Canada has similar permissible levels for water and food.

## What can be done to minimize contamination?

It is very important to make sure there is no PCB contamination in your drinking well water system. Any oily residue or odor emanating from faucets or toilets should be considered PCB contamination until determined otherwise. Do not use the well if tests indicate PCBs are present above state and federal drinking water standards. Your state public health or environmental protection agency should

be able to provide a list of laboratories certified to test drinking water for contaminants in your area.

Preventative measures can also be taken to guard against exposure to PCBs via well pump leaks:



**Submersible  
Well Pump**

Source: Wisconsin Dept. Natural  
Resources Publ. WS-025-92

- If possible, determine the manufacturer and model number of the submersible well pump. State-licensed well drillers and pump installers may help determine whether the pump motor contains a PCB-filled capacitor. A list of pump types and models that may contain capacitors filled with PCBs is included below. This list reflects pumps manufactured after 1960, but should not be considered a complete or fully accurate list due to difficulties associated with obtaining information from pump manufacturers.

- C Replace oil-filled submersible pump motors with water or propylene glycol filled submersible pump motors (replacing a domestic submersible pump ranges from \$600 to \$1,200). Following pump replacement, the well and plumbing system should be cleaned.

The best way to know if you have been exposed to PCBs is through a routine blood test that can detect recent large exposures. The evaluation only indicates one's exposure to PCB's, and cannot predict potential health effects.

## What should you do if you discover PCB contamination?

It is essential that contaminated equipment and fluids be properly disposed. Non-leaking small PCB capacitors may be disposed of in a state approved municipal landfill. Leaking small PCB capacitors are regulated for disposal. For proper disposal guidance, contact your state/provincial or local environmental protection offices.

## Submersible Pump Units Known to Contain PCBs

**Source:** *The Potential for Drinking Water Contamination From Submersible Well Pumps;*  
Wisconsin Bureau of Water Supply  
PUBL-WS-025-92

- C Dempster Industries:** Prior to 1964, Dempster may have distributed pump units manufactured by REDA and Sta-Rite that may have contained PCBs.
- C F.E. Myers:**
- Models SF and SF-2, 2 wire units manufactured from 1964 through 1970 in 1/3 to 1 horsepower;
  - Models SG and S2G, 2 wire units manufactured from 1970 through 1976 in 1/3 to 1 horsepower with date codes prior to 1976 are included.
  - Some S2X models manufactured before 1979 utilized capacitors that contained less than 50 parts per million of PCBs.
- C Fairbanks Morse:** Two wire units manufactured from 1964 through January, 1979 have a coded alpha numeric date code found on the nameplate. These include the ***Colonial series*** and the ***Chateau series*** units with date codes of: A\_\_, B\_\_, C\_\_, DA\_\_, J\_\_, K\_\_, L\_\_, M\_\_, N\_\_, P\_\_, R\_\_, S\_\_, T\_\_, V\_\_, W\_\_, X\_\_. (The blanks are filled in with additional characters).
- Colonial Series*** Model Numbers: A2-2507; A2-3309; A2-5012; C2-3306; C2-7511; E2-7509; E2-10011; G2-1009.
- Chateau Series*** Model Numbers: A2S-3309; A2S-5012; A2S-7517; A2S-10021; C2S-3306; C2S-5008; C2S-7511; C2S-10014; E2S-7509; E2S-10011; E2S-15015; G2S-1009; G2S-15012; 273; 275; 277.
- C Johnston Water Systems:** These pumps were manufactured by Peabody Barnes and will be identified as noted under Peabody Barnes. Models include: V507-31; V507-32; V509-31; V509-32; V513-51; V513-52; V523-100; V531-100; V906-31; V906-32; V909-51; V909-52; V913-75; V917-100; V923-150; VSP913-75; VSP909-52; VSP909-51; V1309-75; V313-100; V317-150; V1306-51; V1307-52; V1809-100; V1813-150;
- C Montgomery Ward:** These pumps were manufactured by Peabody Barnes from 1962 to 1972 and will be identified as noted under Peabody Barnes. Models include: 3677A; 3677B; 3678A; 3678B; 3679A; 3679B; 3680C; 3680D; 3681C; 3681D; 3682C; 3682D; 3682E; 3683C; 3683D; 3684C; 3684D; 3675A; 3675B; 3675C; 24623; 24645.
- C Peabody Barnes:** 2 wire units are identified with the letter “W” as part of the model number. In 1977, an “N” was added to the model number. The date codes are the last 3 or 4 digits of the coding, showing month, then year of manufacture. Codes are located on a stainless steel band located around the discharge neck of the pump.

- C **REDA:** Two wire units have a date code on the nameplate with the format MMY. All models listed below with a year code of 79 or less are included. All motors had the serial number stamped on the head of the motor preceded by the 4-digit date code.

41100; 41101; 41120; 42070; 42090; 42091; 42121; 42131; 42171; 42181; 42251; 43091; 43171; 43181; 43121; 43131; 44091; 44251; 7D9P030; 7D9P031; 9D5P031; 9D6P030; 9D6P050; 9D6P051; 4D35P101; 6D35P151; 7D18P071; 10D18P101; 12D5P050; 12D5P051; 12D5P071; 14D18P151; 17D5P071; 17D9P101; 23D5P101; 23D9P151; 312X7P050; 314X4P050; 314X4P050; 320X4P050; 32D5P151.

- C **Red Jacket:** The capacitor is encapsulated in a plastic housing and the unit is fastened to the bottom of the motor. Although these units are less likely to leak PCBs, there are confirmed cases of PCB contamination from Red Jacket pump motors. Motor Models include two wire units with the designations “BV,” “BVC,” “C,” “W,” and “RW,” 1/3 through 1-1/2 horsepower. The model designation appears as the first part of the identification number.

- C **Sta-Rite:** Two wire units have a date code on the nameplate with the format MYY. Each month is coded as a letter from “A” to “M” and the year as a number. Some three wire motors with Sta-Rite labels have been verified to contain PCBs.